

WHAT IS CLAIMED IS:

1. An apparatus for excluding denser biological materials from less dense biological materials comprising:
  - (a) a container in which biological materials can be centrifuged; and
  - (b) a separation barrier with a lower portion that is a mesh which fits down into
- 5 said container to a depth sufficient to exclude denser biological materials will be accumulated as a result of centrifuging from supernatant.
2. The apparatus of Claim 1 wherein said mesh has openings small enough to prevent migration of said denser biological materials into said supernatant.
3. The apparatus of Claim 1 wherein said mesh has openings large enough to premit material dissolved or suspended in said supernatant to pass through said mesh, thereby remaining in said supernatant.
4. The apparatus of Claim 1 wherein said container is a centrifuge tube and said separation barrier is a centrifuge tube shaped mesh.

5. The apparatus of Claim 4 wherein said separation barrier has a flat ring attached to the large top opening of said centrifuge tube shaped mesh such that said flat ring would prevent said mesh from descending further down into said centrifuge tube than desired.

6. The apparatus of Claim 1 wherein said separation barrier is comprised of a separation barrier plate with a plurality of wells extending downward therefrom and wherein at least a portion of each of said wells consists of an open mesh.

7. The apparatus of Claim 6 wherein said plurality of wells extending downward from said separation barrier plate are sized and located so as to fit down into the wells of container which is a microtiter plate with a plurality of wells.

8. The apparatus of Claim 6 wherein each of said plurality of wells extending downward from said separation barrier plate has a flat bottom which is a mesh.

9. The apparatus of Claim 6 wherein each of said plurality of wells extending downward from said separation barrier plate has a V-shaped bottom which is a mesh.

10. The apparatus of Claim 6 wherein each of said plurality of wells extending downward from said separation barrier plate has a rounded bottom which is a mesh.
11. The apparatus of Claim 6 wherein each of said plurality of wells extending downward from said separation barrier plate has a conical bottom which is a mesh.
12. The apparatus of Claim 6 wherein said microtiter plate has 96 wells.
13. The apparatus of Claim 12 wherein each of said microtiter plate wells has a total volume of about 300  $\mu\text{L}$ .
14. The apparatus of Claim 12 wherein each of said microtiter plate wells has a total volume of about 250  $\mu\text{L}$ .
15. The apparatus of Claim 1 wherein said mesh has openings in the range from about 0.5 inch to about 0.001 inch.
16. The apparatus of Claim 1 wherein said mesh has openings in the range from about 0.005 inch to about 0.05 inch.

17. The apparatus of Claim 1 wherein said mesh has a mesh size in the range from about 70 squares of 0.0075 gauge wire/cm<sup>2</sup> to about 40 squares of 0.009 gauge wire/cm<sup>2</sup>.

18. The apparatus of Claim 1 wherein said separation barrier mesh is made of a material selected from the group of stainless steel, ceramics, glass, quartz, plastic, and plastic coated stainless steel.

19. The apparatus of Claim 18 wherein said separation barrier mesh is made of stainless steel.

20. The apparatus of Claim 18 wherein said separation barrier mesh is made of stainless steel coated with plastic.

21. A method for separating biological materials comprising:  
(a) centrifuging said biological materials in a container;  
(b) inserting a separation barrier having a portion thereof which comprises an open mesh in said container; and

(c) withdrawing a portion of said biological materials from only one side of said separation barrier.

22. The method of Claim 21 wherein said separation barrier is inserted into said container to a depth sufficient to separate aggregated denser materials from supernatant.

23. The method of Claim 21 wherein said container is a microtiter plate having a plurality of wells and said separation barrier has a corresponding plurality of wells.

24. The method of Claim 23 wherein a sample transfer robot is used to withdraw samples of supernatant.

25. The method of Claim 22 wherein said supernatant has plasmid DNA therein.

26. The method of Claim 21 further comprising withdrawing said separation barrier from said container, washing said separation barrier and reusing said separation barrier.

27. A method for separation of plasmid DNA from the remaining portions of cells, said method comprising:

- (a) growing a culture of plasmid DNA;
- (b) lysing cells from said culture to obtain a lysate;
- (c) centrifuging a container of said lysate to obtain a supernatant layer and a layer of aggregated denser materials in said container;
- (d) separating said supernatant layer from said layer of aggregated denser materials by inserting a separation barrier into said container to a level above said aggregated denser materials and below the major portion of said supernatant;
- (e) withdrawing said major portion of said supernatant from above said separation barrier; and
- (f) removing said plasmid DNA from said withdrawn portion of said supernatant.

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